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IS 542 (1968): coconut oil [FAD 13: Oils and Oilseeds]



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IS : 542 – 1968
(Superseding IS : 3471 – 1966)
(Reaffirmed 2004)
2010

Indian Standard
**SPECIFICATION FOR
COCONUT OIL**

(Second Revision)

Sixth Reprint AUGUST 2007

(Incorporating Amendment No. 1 and Including Amendment Nos. 2, 3 & 4)

UDC 665.353.6

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

SPECIFICATION FOR COCONUT OIL

(Second Revision)

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AMENDMENT NO. 2 JANUARY 1990
TO
IS : 542 - 1968 SPECIFICATION FOR COCONUT OIL
(Second Revision)

(Page 4, clause 2.1.1) — Substitute the following for the existing clause:

'2.1.1 Refined Coconut Oil — Refined coconut oil means oil which is obtained by expression or solvent extraction of coconut oil bearing materials, deacidified either with alkali or physical refining or by miscella refining by bleaching with adsorbent earth and/or carbon and deodorized with steam.'

(Page 5, clause 4.3) — Substitute the following for the existing clause:

'4.3 Admixture with Other Oils — The material shall be free from admixture of other oils.

4.3.1 The material shall be free from non-edible oils, when tested in accordance with 9, 10, 11, 12, 14, 15 and 16 of IS : 548 (Part 2)-1976*.'

(Page 7, clause 6.2) — Add the following new clause after 6.2:

'6.2.1 The containers may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. BIS marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.'

*Methods of sampling and test for oils and fats : Part 2 Purity test.

(CAFDC 5)

AMENDMENT NO. 3 DECEMBER 1995
TO
IS 542 : 1968 SPECIFICATION FOR COCONUT OIL
(Second Revision)

(Page 4, Foreword, clause 0.4) — Add the following clause 0.5 after clause 0.4 and renumber the subsequent clause:

'0.5 A scheme for labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF). The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR 85(E) dated 21 February 1991. For a product to be eligible for marking with the ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. The EF requirements for coconut oil, raw and refined are therefore being included through an amendment.

This amendment is based on the Gazette Notification No. 678 dated 30 August 1994 for Labelling Edible Oils, Tea and Coffee as environment friendly products, published by the Ministry of Environment and Forests.'

(Page 5, clause 4.4) — Add the following clauses after clause 4.4:

'4.5 Optional Requirements for ECO Mark

4.5.1 General Requirements

4.5.1.1 The product shall conform to the requirements of quality prescribed under clauses 4.1 to 4.4.

4.5.1.2 The manufacturers shall, produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the norms laid down under the *Water (Prevention and Control of Pollution) Act, 1974; Air (Prevention and Control of Pollution) Act, 1981; Water (Prevention and Control of Pollution) Cess Act, 1977* respectively, along with the authorization, if required under the *Environment (Protection) Act, 1986*, while applying for ECO Mark.

4.5.2 Specific Requirements

Amend No. 3 to IS 542 : 1968

4.5.2.1 The product shall not contain aflatoxin, more than 5 mg/kg, when tested by the method prescribed in Appendix A.

4.5.2.2 The pesticide residues, if any, shall not exceed the tolerance limits as prescribed in the *Prevention of Food Adulteration Act, 1954* and *Rules* made thereunder.

4.5.2.3 Only permitted antioxidants not exceeding the quantities specified against each as prescribed under the *Prevention of Food Adulteration Act, 1954* and *Rules* made thereunder, shall be used, if required.

4.5.2.4 The product shall not contain any of the toxic metals in excess of the quantities prescribed in Table 2.

TABLE 2 LIMITS FOR TOXIC METALS

Sl No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO
i)	Lead, mg/kg, <i>Max</i>	5.0	15 of IS 1699 : 1995*
ii)	Arsenic, mg/kg, <i>Max</i>	0.5	do
iii)	Cadmium, mg/kg, <i>Max</i>	1.0	do
iv)	Mercury (total) mg/kg, <i>Max</i>	0.25	do

* Methods of sampling and test for food colours (*second revision*).

(*Page 5, clause 5.1*) — Add the following new clause 5.1.1 after clause 5.1:

‘5.1.1 For ECO Mark the product shall be packed in such packages which are made from recyclable (that is which can be re-processed to manufacture any useful product) or biodegradable materials.’

(*Page 5, clause 6.1*) — Add the following new clause 6.1.1 after clause 6.1:

“6.1.1 For ECO Mark the containers shall be marked with the following information:

- a) List of identified critical ingredients in descending order of quantity, percent by mass, which shall include ‘made from coconut’;
- b) The brief criteria for which the product has been labelled for ECO Mark; and
- c) Shelf life of the product.”

(Page 7, clause 8.2) — Add the following Appendix after clause 8.2:

'APPENDIX A
(Clause 4.5.2.1)

DETERMINATION OF AFLATOXIN

A-1 REAGENTS

A-1.1 Acetone, 70 Percent — 700 ml acetone in 300 ml distilled water.

A-1.2 Acetone, 20 Percent — 200 ml acetone in 800 ml distilled water.

A-1.3 Lead Acetate, 20 Percent — 200 g neutral acetate in distilled water and 3 ml glacial acetic acid, diluted to one litre.

A-2 PROCEDURE

A-2.1 Dissolve 30 g sample in 100 ml hexane.

A-2.2 Extract with 3 × 50 ml 70 percent acetone.

A-2.3 To the extract add 60 ml distilled water and 20 ml lead acetate.

A-2.4 Boil to reduce volume to 150 ml. Cool to about 20°C.

A-2.5 Filter and wash with 20 percent acetone.

A-2.6 Extract filtrate and washings with 3 × 50 ml chloroform.

A-2.7 Pass chloroform layer through anhydrous sodium sulphate.

A-2.8 Concentrate to 50 ml and spot on TLC plate.

A-3 CALCULATION

$$\text{Aflatoxin, mg/kg} = \frac{V \times s \times 1\,000}{v \times m}$$

where

V = volume of extract in ml,

v = volume of extract giving minimum observable fluorescence in μl ,

m = mass of sample in g, and

s = standard toxin giving minimum observable fluorescence in μg .

(FAD 44)

AMENDMENT NO. 4 MARCH 2002
TO
IS 542 : 1968 SPECIFICATION FOR COCONUT OIL
(*Second Revision*)

(*Amendment No. 3, page 2, clause 4.5.2.1*] — Substitute '5 µg/kg' for '5 mg/kg'.

(FAD 44)

Indian Standard
SPECIFICATION FOR
COCONUT OIL
(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 28 August 1968, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 India ranks among the largest coconut producing countries of the world. The chief coconut growing states in India are Madras, Kerala, Mysore, Orissa, and West Bengal. Considerable quantities of coconut oil, both in the raw and refined state, are used in India for edible purposes and for margarine and bakery fats. Furthermore, the oil finds wide use in the manufacture of soaps and various types of cosmetic and toilet preparations. The requirements for various grades of the oil have, therefore, been so prescribed in this standard that these grades are suitable for the foregoing purposes. The oil is also used for pharmaceutical purposes.

0.3 This standard was originally issued in 1954. In its first revision issued in 1963, the limits of acid value, colour and the moisture and insoluble impurities were modified in the light of experience. As the standard covered only the expressed type of oil, and since there was an urgent need for formulation of an Indian Standard for the solvent-extracted type, IS:3471-1966* was issued as an emergency standard based on the data made available to the *ad hoc* Consultative Group set up for the purpose. After having decided to normalise this emergency standard the need for rationalizing the grades of the oil covered in these standards was keenly felt. This second revision of IS:542-1954 has been prepared amalgamating its earlier revision and IS:3471-1966*. As a consequence, IS:3471-1966* now stands withdrawn.

0.4 The requirements laid down in this standard for the expressed type of the oil correspond to the specifications prescribed by the Directorate of Marketing and Inspection in their Vegetable Oils Grading and Marking

*Specification for solvent extracted coconut oil.

Rules, 1955. For the purpose of regulating the quality of the solvent-extracted type of this oil, the concerned Indian Standard on the solvent-extracted type of the oil which is incorporated now had been adopted in the relevant schedule of the Solvent-Extracted Oil, De-oiled Meal and Edible Flour (Control) Order, 1967. In so far as the edible grades are concerned, this standard takes care of the provisions of the Prevention of Food Adulteration Rules, 1954, as modified from time to time.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for coconut oil used for edible and industrial purposes.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under 2 of IS:548-1964† and also those given below, shall apply.

2.1.1 Refined Coconut Oil—Coconut oil obtained by the process of expression or solvent extraction which has been refined by neutralization with alkali, bleached with bleaching earth or activated carbon or both, and deodorized with steam, no other chemical agents being used.

2.1.2 Semi-refined Coconut Oil—Coconut oil obtained by the process of solvent extraction which has been neutralized with alkali, and with or without bleaching with bleaching earth or activated carbon or both, no other chemical agents being used.

3. TYPES AND GRADES

3.1 The material shall be of the following types and grades:

a) *Expressed*

Refined Grade,
Grade 1A (Raw),
Grade 1B (Raw), and
Grade 2 (Raw).

*Rules for rounding off numerical values (*revised*).

†Methods of sampling and test for oils and fats (*revised*).

b) *Solvent Extracted*

Refined Grade,
Semi-refined Grade, and
Grade 1 (Raw).

3.1.1 The Refined Grades of the expressed and solvent-extracted types and the Raw Grades 1A and 1B of the expressed type are suitable for direct edible consumption.

3.1.2 Raw Grade 2 of the expressed type and the other two grades of the solvent-extracted type are suitable for hydrogenation, refining and other industrial uses, and not for direct edible consumption.

4. REQUIREMENTS

4.1 Description—The material shall be obtained from good quality coconut cake or from clean and sound copra *Cocos nucifera* Linn., fam. Palmæ, by a process of expression.

4.1.1 Solvent-extracted oil shall be obtained from the oleaginous material using solvent hexane conforming to IS: 3470-1966*.

4.2 The material shall be clear and free from rancidity, adulterants, sediment suspended and other foreign matter, separated water, and added colouring and flavouring substances.

4.2.1 The clarity of the material shall be judged by the absence of turbidity after keeping the filtered sample at 30°C for 24 hours.

4.3 Admixture with Other Oils—The material shall be free from admixture with other oils, when tested according to the methods prescribed under 20 of IS: 548-1964†.

4.4 The material shall also comply with the requirements given in Table 1.

5. PACKING

5.1 The material shall be supplied in suitable well-closed container, as agreed to between the purchaser and the supplier.

6. MARKING

6.1 The containers shall be marked with the name, including the type and grade, and weight of the material in the container; manufacturer's name and trade-mark, if any; batch number; and the year of manufacture.

*Specification for hexane, food grade.

†Methods of sampling and test for oils and fats (revised).

TABLE 1 REQUIREMENTS FOR COCONUT OIL

(Classes 4.4 and 8.1)

SL No.	CHARACTERISTIC	REQUIREMENTS FOR TYPE										METHOD OF TEST, REF TO
		Expressed					Solvent-Extracted					
		Refined Grade 1A (Raw)	Grade 1B (Raw)	Grade 2 (Raw)	Semi-Grade refined (Raw)	Grade 1 refined (Raw)	Grade 2 refined (Raw)	Semi-Grade refined (Raw)	Grade 1 refined (Raw)	Grade 2 refined (Raw)	Grade 1 refined (Raw)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)			
i)	Moisture and insoluble impurities, percent by weight, <i>Max</i>	0.1	0.25	0.25	0.25	0.1	0.25	1.0	5 & 6			
ii)	Colour in a 1-in cell on the Lovibond scale, expressed as <i>T + 5R</i> , not deeper than	2	4	11	30	2	10	30	13			
iii)	Refractive index at 40°C	←	←	←	1.448 0 to 1.449 0	←	←	←	10			
iv)	Specific gravity at 30°/30°C	←	←	←	0.915 to 0.920	←	←	←	11			
v)	Saponification value, <i>Min</i>	←	←	←	250	←	←	←	15		of IS: 548-1964*	
vi)	Iodine value (Wijs)	7.5 to 10.0	7.5 to 10.0	7.5 to 10.0	7.5 to 10.0	7.5 to 10.0	7.5 to 10.0	8.0 to 13.0	14			
vii)	Acid value, <i>Max</i>	0.5	2.0	6.0	8.0	0.5	1.0	10.0	7			
viii)	Unsaturation value, percent by weight, <i>Max</i>	0.5	0.8	0.8	0.8	0.5	0.8	1.0	8			
ix)	Polariscope value, <i>Min</i>	13.0	13.0	13.0	—	13.0	—	—	13			
x)	Flash point, Pensky Martens (closed), deg C, <i>Min</i>	—	—	—	—	225	100	90	P: 21 of IS: 1448†			

*Methods of sampling and test for oils and fats (*revised*).

†Methods of test for petroleum and its products: Flash point (closed) by Pensky-Martens Apparatus.

6.2 In addition, in the case of Grade 2 (Raw) of the expressed type oil and the Semi-refined Grade and the Grade 1 (Raw) of the solvent extracted oil, the containers shall also be suitably marked 'NOT FOR DIRECT EDIBLE CONSUMPTION' (either printed on the label affixed to the container or lithographed or stencilled thereon with indelible ink) in a type size of not less than 50 mm.

7. SAMPLING

7.1 Representative samples of the material shall be drawn as prescribed under 3 of IS:548-1964*.

8. TESTS

8.1 Tests shall be carried out as prescribed in IS:548-1964* and IS:1448†. Reference to the relevant clauses of those standards is given in col 10 of Table 1.

8.2 Quality of Reagents— Unless specified otherwise, pure chemicals and distilled water (*see* IS:1070-1960‡) shall be used in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

*Methods of sampling and test for oils and fats (*revised*).

†Methods of test for petroleum and its products.

‡Specification for water distilled quality (*revised*).

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 23230131, 23233375, 23239402

Fax: 91+011 23239399, 23239382

E-Mail : info@bis.org.in

website : http://www.bis.org.in

Central Laboratory:

Plot No. 20/9, Site IV, Sahibabad Industrial Area, SAHIBABAD 201010

Telephone

277 0032

Regional Offices:

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

2323 7617

*Eastern : 1/14 CIT Scheme VII M, V.I.P. Road, Kankurgachi, KOLKATA 700054

2337 8662

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

260 9285

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113

2254 1984

†Western : Manakalaya, E9, MIDC, Behind Marol Telephone Exchange,
Andheri (East), MUMBAI 400093

2832 9295

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001

560 1348

Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE

839 4959

Commercial-cum-Office Complex, Opp. Dushera Maidan, Arera Colony,
Bittan Market, BHOPAL 462016

242 3452

62-63, Ganga Nagar, Unit VI, BHUBANESHWAR 751001

240 3139

5th Floor, Koval Towers, 44 Bala Sundaram Road, COIMBATORE 641018

221 0141

SCQ-24, Sector 12, Faridabad 121007

229 2175

Savitri Complex, 116 G.T. Road, GHAZIABAD 201001

286 1496

53/5 Ward No. 29, R.G. Barua Road, 5th By-lane, Apurba Sinha Path,
GUWAHATI 781003

245 6506

5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001

2320 1084

Prithavi Raj Road, Opposite Bharat Overseas Bank, C-Scheme, JAIPUR 302001

222 3282

11/418 B, Sarvodaya Nagar, KANPUR 208005

223 3012

Sethi Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road,
LUCKNOW 226001

261 8923

H. No. 15, Sector-3, PARWANOO, Distt. Solan (H.P.) 173220

235 436

Plot No A-20-21, Institutional Area, Sector 62, Goutam Budh Nagar, NOIDA 201307

240 2206

Patliputra Industrial Estate, PATNA 800013

226 2806

Plot Nos. 657-660, Market Yard, Gultkdi, PUNE 411037

2427 4804

"Sahajanand House" 3rd Floor, Bhaktinagar Circle, 60 Feet Road,
RAJKOT 360002

237 8251

T.C. No. 2/275 (1 & 2), Near Food Corporation of India, Kesavadasapuram-Uloor Road,
Kesavadasapuram, THIRUVANANTHAPURAM 695004

256 7914

1st Floor, Udyog Bhavan, VUDA, Siripuram Junction, VISHAKHAPATNAM-03

271 2833

*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, KOLKATA 700072

2366 3243

†Sales Office (WRO) Plot No. E-9, MIDC, Rd No. 8, Behind Telephone Exchange,
Andheri (East), Mumbai-400 0093

2832 9295